Discrimination based on place of residence and access to employment

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The purpose of this study is to assess the degree of employment discrimination against young people in the Ile-de-France region according to their place of residence by considering several spatial scales in order to measure the effect of the reputation of the administrative department or county (specifically Paris and Seine-Saint-Denis), the town or municipality, and of the local neighborhood. The evaluation is carried out using experimental testing-type data that we developed following a protocol that allows us to examine the specific effects associated with each of these three spatial scales on access to employment, as well as their combined effects. We are interested in discrimination regarding two specific occupations within the restaurant/catering industry, namely waiters and cooks, and we consider the impact of two levels of qualification. For each of these profiles, we constructed six fictional candidacies consisting of young men who were similar with the exception of the testing feature which differentiates them, namely their place of residence. Between October 2011 and February 2012, we studied 2,988 candidacies that were submitted in response to 498 job offers posted in the Ile-de-France region. This study consists of a statistical and econometric analysis of the responses that we obtained to these applications.

*CAP: Certificat d'Aptitude Professionnelle (or Occupational Certificate)

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JEL Codes: C81, C93, J15, J71

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*CEREMAP: Centre pour la recherche économique et ses applications (Center for economic research and its applications
*JMA: Journée de Microéconomie appliquée (Applied Microeconomics Days)

1. Introduction

The place where you live can have a decisive influence on the chances of obtaining a job for several reasons. First, the physical distance between the place of residence and the available jobs complicates the job search process and decreases the chances of leaving unemployment according to the so-called 'Spatial mismatch' effect (for a review of the literature on this subject, see Gobillon *et alii*, 2007, or Hellerstein and Neumark, 2011). Second, the socio-demographic composition of the geographical area affects the chances of accessing employment through neighborhood, peer, or social media effects, all three of which play a major role in the search for employment (see Galster, 2010). Furthermore, the presence of local amenities, and notably the endowment of public sector employment, and subsidised employment influence the employment and unemployment dynamics of the localities. Finally, employers can have particular preferences for workers from a certain locality regardless of the commuting time between the place of residence and the workplace. In this particular paper, we seek to discern discriminatory employment behaviour tied to the place of residence according to the third mechanism.

Measuring discrimination in hiring is based on the method of testing. This method allows one to compare, *all other things being equal*, the access rates to employment opportunities of fictional candidates that are similar by design in all respects except for the characteristic whose impact is the focus of the test. A test of access to job interviews (« *Correspondence Testing* ») allows one to measure an effect specific to the place of residence independently from the impact of skill mismatches of the residents or from the physical distance to the job, i.e. other channels which are frequently advanced in the literature pertaining to a localisation effect. It consists of drafting and sending two fictional yet realistic curriculum vitaes which are similar in all respects except for the non-productive characteristic whose influence on the hiring process we seek to assess: in this case the place of residence. Both job applications are sent simultaneously in response to the same job offers. The testing method allows one to control for the effects of other determinants of the access to job interviews because the candidates are completely fictional, and the job applications are sent by the researchers themselves. For these reasons any observed differences in the responses on the part of firms cannot be attributed to a selection bias, unobserved heterogeneity, network effects, or different levels of search motivation. Furthermore, the characteristics of the job offers and the skills needed to complete the tasks, as well as the type of enterprise, are observable. This type of experimental approach has already been successfully implemented in

order to measure the interacted effects of the place of residence and the ethnic origin on the chances of being called for an interview in the United-States by Bertrand and Mullainathan (2004). In France, an early paper authored by Duguet *et alii* (2010) showed the statistically significant effect of the place of residence independently of the ethnic origin for the accounting profession. Petit *et alii* (2013) confirm that same effect for the waiters, while L'Horty *et alii* (2012) find a stronger effect of the locality of residence for computer scientists who are women of French origin.

In all these papers dealing with employment discrimination based on the place of residence, and more generally in the literature on neighbourhood effects, the definition of the boundaries and scope of the neighborhood are rarely questioned. Similarly, when the effects of the location are mentioned, the size of the region is rarely specified. This is not to say that the notion of region such as the neighbourhood necessarily corresponds to a specific and precisely determined geographical area. Nonetheless, the measure of a neighbourhood effect may vary *a priori* according to the boundaries of the region, and therefore it is interesting to consider incorporating larger or smaller scales into the analysis. It is also important to investigate whether the effect of the neighborhood can be sensitive to its urban environment. Does living in a disadvantaged neighbourhood, which is typically labelled as a geographical priority area of the city (in the French context), have the same effects if that area is located in a more advantaged locality or a less advantaged one?

This study's novelty lies in the experimental measure of neighbourhood effects derived from a multi-level protocol that allows one to decompose the effects specific to the department, to the locality, and to the address of the subject. This protocol was applied to the Ile-de-France region in order to compare some neighbourhoods in Paris to some addresses from Seine-Saint-Denis which are located in favoured as well as less favoured areas.

The study is organized as follows. Section 2 surveys the results of several previous works done in France using similar methods. The third section of the paper describes the protocol that was used to build the database, while the fourth and the fifth sections present the results and describe the econometric methods. Finally, the last section discusses the implications of these results for public policy recommendations.

2. Data Collection Protocol

If one seeks to evaluate employment discrimination related to the place of residence, there needs to be a comparison of the access to employment of individuals who are similar in all respects except for the location of their residence. By taking account of all other explanatory factors of the individual's situation on the labour market, we ensure that it can only be linked to their place of residence. This involves comparing the chances of hiring of two candidates for which the only difference between them is their place of residence. These candidates must therefore share all the individual characteristics (sex, origin, age, marital status, mobility, extra-professional activities), the same human capital (degrees, experience, technical and language skills), exert the same job search efforts, display the same level of motivation, apply to the same type of vacancies for the same positions at the same time. At this early stage of the recruitment process, involving only applications and callbacks, we are holding the level of motivation and the level of job search fixed.

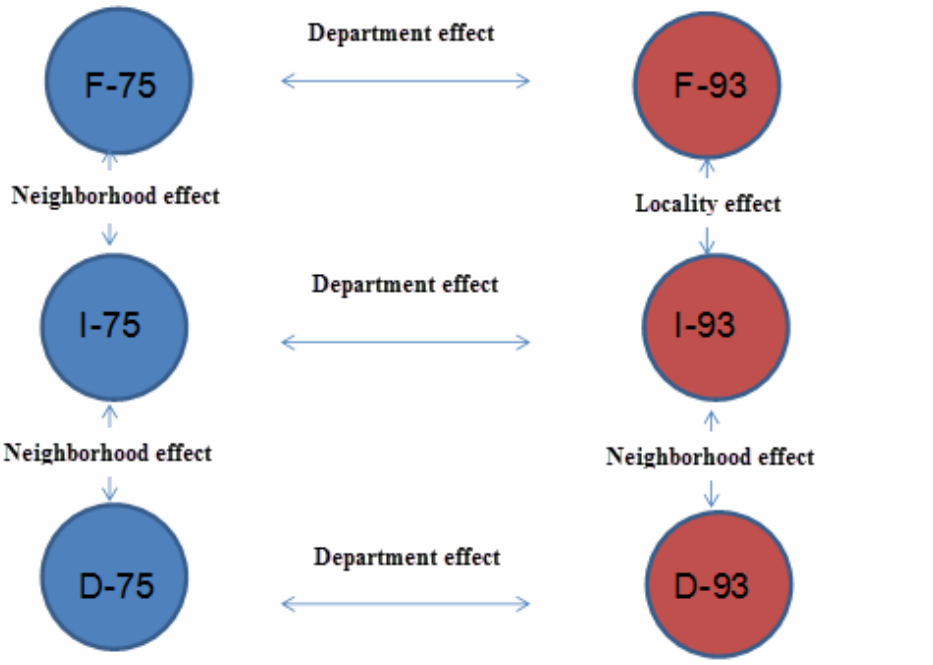
These difficulties that are particular to assessing the degree of discrimination are overcome, *all other things being equal*, by using a methodology consisting of a controlled experiment called *testing.* In principle, it consists of drafting from scratch two fictitious résumés which are perfectly similar in terms of qualifications and career paths. The only significant point of distinction that is apparent in these two applications is the one whose impact on access to employment we seek to assess (for example, the place of residence). Both resumes are sent simultaneously in response to the same job offers at the same companies. Since both applications are perfectly similar with the exception of one feature, any significant gap in access to interviews between these two fictitious candidates cannot be attributed to anything else but the isolated effect of this feature. Our measure of access to employment is the discrete and observable event of whether or not the applicant received a call-back for an interview.

The data employed in this study were constructed using the method of *testing* and were derived from an experimental protocol. The experiment consisted of sending over 3,000 applications drafted from scratch in response to a sample of job offers that were posted between October 2011 and February 2012. In this section, we present in detail how the data were collected.

Six Locations

Six young candidates' very similar resumes were drafted from scratch. They differ only in their place of residence, which appears explicitly in their application. The places of residence of the six fictitious candidates are selected in order to measure three distinct effects on the access to employment, all other things being equal: the effect of the reputation of the administrative department of residence (similar to a county), of the locality (or municipality) within that same department, and of the neighbourhood within that locality (Figure 1). We first chose two departments that were geographically close to each other yet quite differentiated in terms of the average standards of living of their residents, Paris and the department of Seine-Saint-Denis. Within each department, we chose three addresses in neighbourhoods or localities having very distinct reputations but situated close to each other. The geographical proximity of these locations facilitates the measurement of the neighbourhood effects given the travelling distance to work.

Figure 1
The Measured Effects



F-75 : candidates from the favoured neighbourhood in the 18th district of Paris
I-75 : candidates from the intermediate neighbourhood in the 18th district of Paris
D-75 : candidates from the Goutte d'or neighbourhood (classified ZUS)*
F-93 : candidates from the town of Le Raincy in Seine-Saint-Denis
I-93 : candidates from the town of Bondy in Seine-Saint-Denis, intermediate neighbourhood
D-93: candidates from the city of Bondy in Seine-Saint-Denis, disadvantaged neighbourhood (classified ZUS)

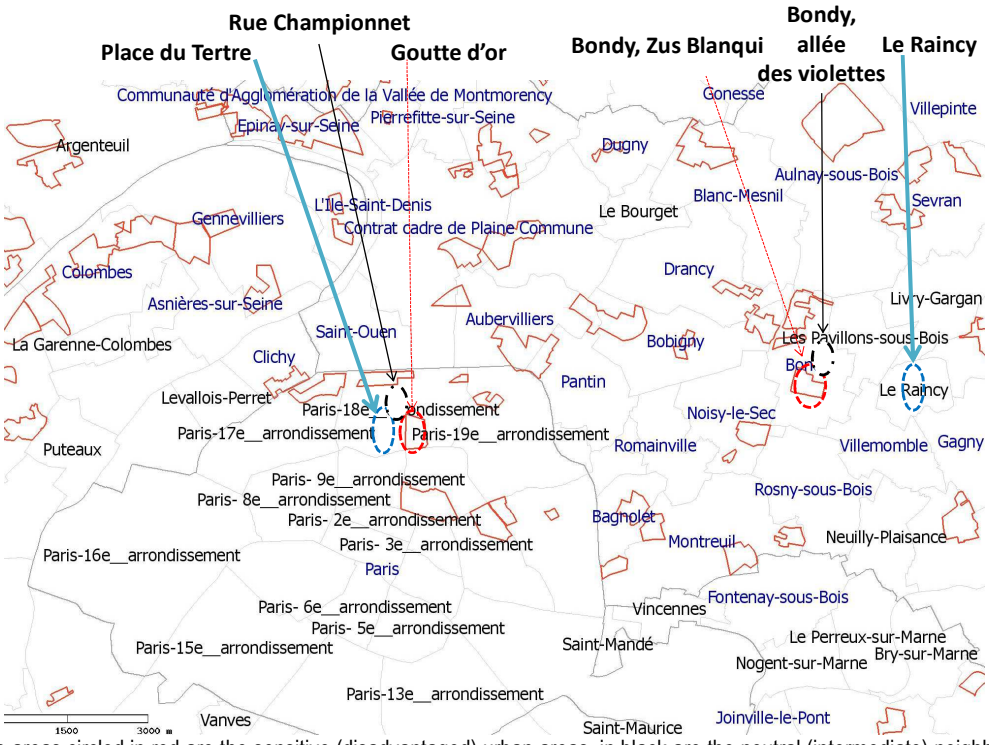
*ZUS: Zone Urbaine Sensible= Sensitive Urban Area

The first set of three fictitious candidates resides in Paris in the 18th district. They are distinguished by the reputation of their neighbourhood, which is identified by the street on which they reside. One of the candidates resides in an area which is considered to be advantaged (Place du Tertre). Another lives in a disadvantaged neighbourhood known and classified as a sensitive urban area (Boulevard Barbès, ZUS Goutte d'Or). The third candidate is located in an intermediate area (Championnet Street). The second set of three fictional candidates resides in the department of Seine-Saint-Denis. Two of them live in the town of Bondy; one of them in a neighbourhood that is classified as an urban sensitive zone` (Building Pavilion Bleriot Avenue, ZUS of the Blanqui neighborhood), and the other one in a less disadvantaged area (Violettes alley). The third candidate lives in the neighbouring town of Le Raincy (Augusta Alley), which is reputed to be a favoured area without any neighbourhoods which are classified as sensitive urban areas (ZUS). The places of residence of the six fictitious candidates are summarized in Table 2, and their locations are shown on Map 1.

Table 2
Places of residence of the 6 fictitious candidates

Reputation of the place of residence	**18ème district of Paris (postal code 75018)**	**Seine-Saint-Denis (department number 93)**
Disadvantaged (in ZUS)	*Candidate D-75* Barbès Boulevard 75018 Paris (Zus Goutte d'Or)	*Candidate D-93* Pavillon Building Blériot avenue 93140 Bondy (Zus Quartier Blanqui)
Intermediate	*Candidate I-75* Championnet street 75018 Paris	*Candidate I-93* Des Violettes Alley 93140 Bondy
Advantaged	*Candidate F-75* Place du Tertre 75018 Paris	*Candidate F-93* Augusta Alley 93340 Le Raincy

Map 1. Location of the advantaged and disadvantaged neighbourhoods



Notes: The areas circled in red are the sensitive (disadvantaged) urban areas, in black are the neutral (intermediate) neighbourhoods, and in blue are the privileged (advantaged) neighbourhoods.
*arrondissement=district, Rue=street, Allée =alley

Source: General Secretariat of the Interministerial Committee on Cities - City GIS

These choices of location are justified by the statistics presented in Table 3. The socio-economic indicators for the 18th district are slightly below the average of the indicators for the other districts in Paris. In particular, the median income and the percentage of households that have taxable income are lower than in other districts, and the proportion of the population living in ZUS areas is slightly higher than in other districts (1.5% compared to 0.3% over all the districts of Paris). That district is in fact very heterogeneous; all three types of neighbourhoods coexist, from the advantaged to the intermediate to the disadvantaged (ZUS classified) ones. Turning to the Seine-Saint-Denis department, the exit rate from unemployment to employment is close to the average rate prevailing in all of Paris. However, in that department comprised of suburbs, people often do not have secondary-school diplomas. The proportion of residents of this department living in ZUS areas is much higher than it is in Paris, and the median income level as well as the proportion of households having taxable income are lower as well. Those average characteristics of Seine-Saint-Denis, however, hide some disparities between and within communities. Some communities are particularly disadvantaged, while others have very favourable socio-economic indicators. This is particularly the case of the town of Raincy, whose indicators are generally more

favourable than those for Paris, and especially more favourable than those of the 18th district. The exit rates from unemployment to employment and the proportion of households having positive taxable income are higher in Raincy than in the 18th district of Paris; in a similar vein, the unemployment rate and the proportion of people without a high school diploma are substantially lower. Moreover, unlike the 18th district of Paris, Le Raincy contains no Sensitive Urban Zone (ZUS). That is not the case for Bondy, however, which is characterised by much less favourable indicators. The exit rates from unemployment to employment and the unemployment rate are close to those of the 18th district of Paris, but a third of the population lives in ZUS areas, and the median income and the share of households with taxable income are below the averages of the department and of Paris. A third of the inhabitants of Bondy live in ZUS areas, while on average in Seine-Saint-Denis, this proportion is lower than one quarter.

Table 3

Statistics relative to the place of residence of the fictitious candidates

	Paris		Seine-Saint-Denis		
	Average of the 20 districts	18th district	Average of departments	Le Raincy	Bondy
Gross exit rates from unemployment (return to work) in 2006*	34,24	28,71	34,65	40,12	35,03
Net exit rates from unemployment (return to work) in 2006*	33,22	29,31	33,38	38,30	32,62
Share of individuals without a HS degree in 1999**	10,84	16,35	20,20	08,48	21,12
Unemployment rate in 1999**	11,37	16,90	16,37	09,01	17,06
Share of the population of the municipality in ZUS**	0,29	1,56	17,86	0	33,15
Median household income by unit of consumption in euros in 2006**	25591	16079	15330	25151	13200
Share of households with taxable income in 2006**	73,33	66,2	64,80	78,9	60

Sources: * SOLSTICE Estimates from Pôle Emploi's Statistics History File. Census ** INSEE.

Notes: "Gross rate of exit from unemployment" corresponds to the exit rate from unemployment from the locality, where the transition is the return to employment. The "net rates of exit from unemployment" are, in turn, derived by calculating the rate of exit from unemployment that the locality would have if the job seekers had the same composition as those in Ile-de-France.

The access-to-interview rates of the 6 candidates were compared on a pair-wise basis for the purposes of isolating several effects, which are summarized in Table 4. It is important to note that these effects are interpreted holding all other factors constant, and in particular holding the distance to work fixed. First we evaluate *an effect of the reputation of the department of residence associated with a given type of area* by comparing the chances of success of a candidate who resides in the 18th district of Paris versus one who resides in Seine-Saint-Denis. This comparison is performed for three pairs of candidates: a) those who live in a poor neighbourhood classified as ZUS from the 18th district of Paris versus those from Bondy, b) those who live an intermediate area of the 18th district of Paris versus those from Bondy, and c) those who reside in a favoured area of the 18th arrondissement of Paris

versus those from Raincy. This departmental effect is therefore conditional on the reputation of the neighbourhood or of the municipality of residence. Second, we estimate *the effect of the reputation of the place of residence within a given department*. To achieve this we compare the chances of a candidate receiving a callback living within Seine-Saint-Denis in the town of Raincy (considered to be advantaged) to one living within Seine-Saint-Denis in the town of Bondy (considered to be less advantaged). Finally, we evaluate *an effect of the reputation of the neighborhood of residence within a given locality* by comparing the chances of success of a candidate living in an intermediate neighbourhood with the chances of one living in a disadvantaged neighbourhood of the 18th district of Paris, or the chances of a candidate living in an intermediate neighbourhood with those of one living in a disadvantaged neighbourhood Bondy, Seine-Saint-Denis.

Tableau 4
The Measured Effects

Pairwise comparison of candidates	Measured effects
Candidate D-75 *versus* Candidate D-93 Candidate I-75 *versus* Candidate I-93 Candidate F-75 *versus* Candidate F-93	*Effect of the* reputation of the department Are the chances of success of a candidate living in the 18th district of Paris or in Seine-Saint-Denis different when the candidate lives in … A disadvantaged neighbourhood (classified ZUS)? An intermediate neighbourhood? An advantaged neighbourhood?
Candidate F-93 *versus* Candidate I-93	*Effect of the reputation of the locality or town* Are the chances of success of a candidate living in Seine-Saint-Denis different if he lives in Raincy or in Bondy?
Candidate I-75 *versus* Candidate D-75 Candidate I-93 *versus* Candidate D-93	*Effect of the reputation of the neighbourhood* Are the chances of success of a candidate different when the candidate lives in an intermediate neighborhood versus a ZUS… in the 18th district of Paris ? in Bondy, Seine-Saint-Denis ?

Choice of two occupations working in tight labour markets: waiters and cooks in restaurants

The methodology of testing is particularly costly to implement, and thus it is beyond the scope of our paper to examine all the occupations comprehensively. We elected to select certain occupations within the same industry for which there is a high degree of market activity, i.e. effective supply as well as effective demand. Indicators for the degree of labour market tightness within this "employment Pole" were used to select the occupations that were included in our testing procedure. We chose occupations for which the number of unemployed workers and the number of job offers in Ile-de-France were substantial. By selecting an occupation with a high number of job seekers, one limits the probability of detection of a suspicious job application when a large number of resumes are sent simultaneously. By selecting an occupation characterized by tightness in the labour market, one limits the number of refusals from employers with or without discriminatory behaviour.

This methodological precaution proved to be particularly useful in the context of an economic recession. Nevertheless, the somewhat high success rates of applicants in an occupation with a tight labour market have a counterpart in terms of discrimination: the call-back process becomes less selective, and it is therefore more difficult to observe discrimination in hiring under these conditions. We elected to carry out our testing in a context that should lessen the degree of discrimination in hiring.

Among all occupations with tight labour markets, we have chosen occupations in the restaurant industry because restaurants are spatially widely dispersed in Ile-de-France. As the location of our candidates is given in his/her application, it is believed that the dispersion in distances from homes to workplaces will be sufficient to evaluate the effect of residence regardless of transport time between residences and workplaces. On this basis, two occupations were subjected to testing in the restaurant industry: cooks and waiters.[1] These two occupations are characterized in particular by their exposure to customers, which may play a role in discrimination in hiring (Neumark *et alii*, 1996). Statistics on this industry are provided in Appendix 1. For each of these two occupations, two skill levels were examined: skilled jobs requiring a degree of level IV (the French BAC-PRO, an high school diploma specialised in a profession) and less-skilled jobs requiring a degree of level V (the French CAP that is a vocational certification inferior to a high school diploma).

Similar fictitious candidates

The applications that were sent in response to the same job offers are perfectly similar in terms of productive characteristics and individual characteristics other than the one from which the effect is subjected to testing, namely the place of residence. In particular, these applications are similar with respect to educational background, career path, and job experience in both quantitative and qualitative terms. These applications are also credible for the targeted occupations. They were vetted and validated by professionals with experience

[1] According to data drawn a Historic Data File of the French unemployment agency ("Pôle Emploi"), the "kitchen staff" occupations in Ile-de-France include both a large number of job applications (5,529 job applications a year from March 2009 to March 2010) and a significant number of job offers (13,164 during that same period). The tightness rate for this occupation (the number of job offers recorded in one month of a year divided by the number of job applications a year) is high (0.62) relative to other professions or occupations. These same statistics for the occupation of waiters in restaurants are 5,622 job applications and 8,875 job offers respectively, for a tightness rate of 0.48. For the purposes of comparison, the figures for masonry in Ile-de-France over the same period are 4,075 job applications and 2,371 job offers for a tightness rate of 0.26

working in the industry before being submitted: this expertise ensures that applications are similar, realistic, and relevant.

The six fictitious candidates are French, and the sound of their first and last names does not suggest that they are first or second-generation immigrants. They are all males, and their given names are among the most common in France. Their given names indicate their gender and are the most common ones for their year of birth (1984 for the qualified candidates and 1989 for the less qualified candidates). The six qualified candidates are 27 years old, and the less-qualified ones are 22 years old. All candidates display on theirs job applications being single, without children, holding a driver's license, and having a car.

These six candidates followed the same training path: the less-qualified ones received a Professional Aptitude Certificate (CAP) in 2007, and the most-qualified ones hold a CAP and a professional high school diploma (BAC-PRO), validated in 2002 and in 2004 respectively. These qualifications have been obtained in the context of an apprenticeship (two years for a CAP only and four years for CAP followed by a professional high school diploma). The qualifications of all candidates are listed in Table 5.

Table 5
Qualifications of the fictitious candidates

	Waiters	**Cooks**
Less qualified jobs	6 candidates holding a ''Restaurant'' CAP	6 candidates holding a 'Kitchen'' CAP
Qualified jobs	6 candidates holding a ''Restaurant'' CAP and a professional high school diploma specialised in ''Catering, specialized in service and commercialisation''	6 candidates holding a ''Kitchen'' CAP and a professional high school diploma specialised in 'Catering, specialized in Culinary Production''

Since leaving the education and training system, the six most qualified candidates that are cooks or waiters have accumulated seven and a half years of experience in three different establishments. It is mentioned in their job application that one of the restaurants where the candidate has worked was a gourmet type, and the other two were of the traditional type. The six less-qualified candidates worked in three different restaurants, all of the traditional type, since getting their CAP four and a half years ago. None of the candidates has reported a period of unemployment: they were all employed when they applied for the job. In total, we have drafted 24 fictional applications (CV and cover letters of application): six duplicate

profiles for two occupations (cooks and waiters) and for two levels of qualification (skilled and less skilled).

Marginal differentiation and the permutations for job applications

Since the applications were sent in response to the same job offers, they had to include some elements of differentiation. These differences relate to the presentation of the resumes while remaining standard in format, i.e. the type of font, font size, layout of the page, etc. The candidates' experiences are from real companies which are different yet comparable (in terms of service line and size). They all received their degree(s) and began their careers outside of Ile-de-France in different cities,[2] but they have lived and worked in Ile-de-France for more than a year. The candidates' recreational activities and hobbies are also different - impersonal and without being excessively original or esoteric (sport, cinema, reading, music, etc...). The brief cover letters accompanying the CVs were also formulated differently without being too unique. A postal address, cellphone number and email address have been allocated to each candidate.

To avoid having the style or content of a particular application systematically influencing the selection of companies for a particular candidate (and this risk despite the precautions taken during the drafting of the application), we have developed a system of random rotations between the CVs of the identities of the fictitious candidates. The sources for the listings of job offers were alternated between the candidates throughout the job search process.

Collection of job offers and field testing

Websites from 'Pôle d'Emploi' and from 'L'Hôtellerie-Restauration' that centralize most of the employment opportunities in the catering sector were consulted daily in order to collect job offers. We sent applications to all offers that were relevant for the study that were available on the two websites, insofar as the employer allowed a contact by either regular post or by email.[3]

All job offers for waiters or cooks requiring a CAP or a professional high school diploma in either fixed-term or permanent contracts and located in Ile-de-France fall within the scope of the study. We tested all the offers that became known to us from mid-October 2011 to early February 2012. A total of 498 job offers from separate establishments were subjected to

[2] The provincial cities where the candidates have completed their formation and started their careers are Compiègne, Orléans, Angers, Le Mans, Evreux and Chartres.
[3] We have excluded the offers in which the employer required a telephone call or an on-site meeting.

testing: 253 job offers for cooks and 245 job offers for waiters. This corresponds to sending 2,988 applications (6 x 498).

We modelled the outcome of obtaining a job interview. In the event of a success, however, no candidate was sent to an interview for the following two reasons related to methodology. First, physically sending candidates for interviews would introduce a bias due to the subjective judgment by recruiters of the appearance, behaviour, or personality of candidates. As this inevitable bias is unobservable to researchers and cannot be controlled for, it would generate a flawed measure of discrimination in hiring. We believe that as long as the organizing and arranging of interviews generates a cost to the recruiter, he/she will only convoke candidates who actually have a fair chance of obtaining the job. We therefore assume that discriminatory behaviour on the part of employers occurs primarily during the selection of written applications of candidates who are granted an interview (for which the potentially discriminating factor is the residence explicitly appearing on the resume). There are also no photographs of the candidates on their written applications. Second, the process of data collection is simplified, so that for a given time period (of about four months in this case), we are able to generate a more substantial sample size (nearly 500 job offers were tested).

Applications in response to the same job offer were usually sent on the day of release of the offer by e-mail from the mailbox of each candidate, or by the post. In the latter case, applications were mailed from various post offices in Ile-de-France in order to reduce the risk of detecting patterns in our *testing* procedures.

The response is considered to be positive when the recruiter invites the applicant to an interview, or if he/she conveys interest in obtaining more information on the present situation of the candidate or on his qualifications. However, the response is considered negative if the recruiter formally refuses the application, or if there is no reply.

3. Descriptive Statistics on Success Rates

We first present descriptive statistics drawn from the data set that is generated from our testing experiment on the success rates of different profiles of candidates. These call-back

rates for invitations to a job interview give a general idea of the extent of discrimination, but it is important to confirm whether the differences observed are robust to the inclusion of several different characteristics of the job offers. Indeed, while the characteristics contained in the resume sent in response to each offer are similar, except for the place of residence, the job offers are in turn very diverse in nature. In the following section we take into account the characteristics of the offers.

Success rates by place of residence of the candidate

Overall, 38.5% of job offers that were subjected to testing led to a positive response for at least one of the six fictitious candidates. The positive response rate is slightly higher for cooks (41.9%) than for waiters (35, 1%), reflecting a looser labour market in the case of the latter (Table 6). This finding is consistent with what was reported in the survey data contained in *The Labour Force Needs*, conducted by 'Pôle d'Emploi', in which employers at hotels, cafes, and restaurants reported having greater difficulty recruiting cooks (45% in Paris and 59% in Seine-Saint-Denis) than waiters (38% in Paris, 25% in Seine-Saint-Denis) (see Table A2 of the Appendix). The response rate is globally satisfactory, and even higher than that obtained in the testing investigations carried out by Duguet *et alii* (2010) and Petit *et alii* (2012).

Table 6
Distribution of the number of positive responses by job offer

	All	Cooks	Waiters
None	61.5%	58.1%	64.9%
1 or more	38.5%	41.9%	35.1%
1 and 2	16.1%	16.2%	15.9%
3 and 4	10.2%	10.3%	10.2%
5 and 6	12.2%	15.4%	9.0%

A first indication of the results is presented in terms of gross success rates cross-tabulated for each type of candidate (Table 7). We note that the pattern of gross rates of success according to the neighbourhood quality for cooks as well as for waiters, and for skilled occupations as well for the less-skilled occupations, are in line with our expectations. We also note that success rates are lower for the least qualified profiles than for the most qualified ones, and they are generally higher for cooks than for waiters.

Table 7
Gross rate of success on the same job offers

	Positive answers rate	t-statistic	90% confidence interval	
			Lower bound	Upper bound
Cooks				
Level CAP				
Disadvantaged neighbourhood	19.3%	8.05	15.4%	23.3%
Intermediate neighbourhood	22.3%	8.85	18.2%	26.4%
Advantaged neighbourhood	23.7%	9.06	19.4%	28.0%
Level BAC				
Disadvantaged neighbourhood	25.4%	8.82	20.7%	30.1%
Intermediate neighbourhood	26.3%	9.11	21.6%	31.0%
Advantaged neighbourhood	26.2%	9.05	21.5%	31.0%
Waiters				
Level CAP				
Disadvantaged neighbourhood	13.7%	7.06	10.6%	16.9%
Intermediate neighbourhood	14.7%	7.30	11.4%	18.1%
Advantaged neighbourhood	16.0%	7.67	12.6%	19.4%
Level BAC				
Disadvantaged neighbourhood	20.2%	6.65	15.2%	25.1%
Intermediate neighbourhood	19.6%	6.61	14.8%	24.5%
Advantaged neighborhood	24.2%	7.53	18.9%	29.4%

t-statistics and confidence intervals were calculated using the bootstrap method based on 10, 000 draws.

This apparent hierarchy of success rates by neighbourhood of residence appears to be sharper in Paris than in Seine-Saint-Denis. Note that the differentials in the success rate by place of residence are remarkable. A favourable location doubles the chances of being invited to a job interview for waiters of CAP level, for which the success rate rises from 9.6% if they reside in an intermediate area of Seine-Saint-Denis to 19.9% if they reside in an intermediate area of Paris. For skilled waiters, deviations in the success rates range up to 200 % between an intermediate neighborhood of Seine-Saint-Denis (10.2%) and an advantaged area of Paris (29.1%). To proceed further, we must test whether these differences in success rates are significant.

The purpose of Table 8 is to test the pair-wise differences in success rates in order to determine if they are significantly different from zero. The first part of the table lists the estimates of the effects of the department (Paris compared to Seine-Saint Denis) conditional on the neighbourhood of residence, occupation, and level of training. We discern the expected sign of the effect of the department for almost all of the profiles of candidates, and these estimates are statistically significant. The effect is often of high magnitude, with

differences in success rates across departments being much higher than is the case for the other spatial scales. It is noteworthy that the effect of the department is still much stronger than the effect of neighbourhood.

The effect of the locality (or town) is shown in the section "Intermediate versus Advantaged Effect" corresponding to the Seine-Saint-Denis row. We compare the effect of living in the town of Bondy rather than in Raincy. We actually found a significant effect but only for the most qualified waiters, for whom the difference in success rates is 6.76 percentage points.

There is also an effect of the type of area (i.e. disadvantaged versus intermediate) conditional on the department, but it is less marked than the effect of the department conditioned on the neighbourhood. This former effect is significant only for certain profiles and for certain neighbourhoods. The effect of the disadvantaged neighbourhood *versus* the intermediate neighbourhood is significant at 10% level for less-skilled cooks in Seine-Saint-Denis and for the skilled waiters from Paris.

The estimated effects are almost always more pronounced for waiters than for cooks. One possible interpretation of this result is that the market for cooks is a bit tighter, which makes discriminatory behaviour more costly for employers. Another interpretation is that the waiters are in face-to-face contact with customers, which can potentially constitute an additional source of discrimination. A server has to master customer relations, which requires strong interpersonal communication skills. Employers could display prejudice by believing that living in a poorer area could be associated with lower expressive and communication skills of candidates. Discrimination related to the place of residence against waiters would be a case of statistical discrimination evoked by Arrow. This interpretation is consistent with the results of an earlier study derived from French data, which indicated that discrimination is more pronounced in France for professions and occupations that interact with the customers. This would explain why foreigners face greater difficulties accessing employment in the large urban centers where these occupations are concentrated (Bouvard *et al*, 2008).

Table 8
Differences in success rates on the same job offers

pairwise comparisons on the same job offers	Gap (in % points)	t-statistic	Gap (in % points)	t-statistic
*Joint effect of the department and disadvantaged neighbourhood (*Disadvantaged Seine-Saint-Denis versus advantaged Paris)				
	Cooks		**Waiters**	
CAP	**-6.6***	**-1.95**	**-10.3*****	**-3.78**
BAC	**-7.8***	**-1.85**	**-14.7*****	**-2.62**
Effect of the department (number 93 versus number 75)				
	Cooks		**Waiters**	
CAP				
Disadvantaged neighbourhood	-0.67	-0,20	**-5.78****	**-2.20**
Intermediate neighbourhood	-0.74	-0,28	**-10.28*****	**-3.41**
Advantaged neighbourhood	-3.69	-1,10	**-10.33*****	**-3.56**
BAC				
Disadvantaged neighbourhood	-4.29	-1,04	-6.83	-1.55
Intermediate neighbourhood	**-12.99*****	**-3,29**	**-19.08*****	**-4.26**
Advantaged neighbourhood	**-9.53****	**-2,13**	**-14.59****	**-2.70**
Effect of neighbourhood, disadvantaged *versus* intermediate				
	Cooks		**Waiters**	
CAP				
Paris	-2.90	-0.94	-3.16	-1.37
Seine-Saint-Denis	-2.92*	-1.66	1.32	0.65
BAC				
Paris	-5.19	-1.52	**-5.60***	**-1.70**
Seine-Saint-Denis	3.50	1.03	**6.73***	**1.93**
Effect of neighbourhood, disadvantaged *versus* advantaged				
	Cooks		**Waiters**	
CAP				
Paris	**-5.81***	**-1.89**	**-4.49****	**-2.13**
Seine-Saint-Denis	-2.89	-1.15	0.01	0.01
BAC				
Paris	-3.47	-0.95	-7.98	-1.50
Seine-Saint-Denis	1.75	0.51	0.00	0.00
Effect of the locality (effect Bondy versus Raincy in Seine-Saint-Denis)				
	Cooks		**Waiters**	
CAP	-0.01	0.00	-1.27	-0.71
BAC	-1.75	-0.49	**-6.76***	**-1.95**

The t-statistics were calculated using the bootstrap method done over 10 000 draws.
Notes : For example, to measure the effect of the disadvantaged neighbourhood compared to the advantaged neighbourhood, we subtract the success rate of the disadvantaged neighbourhood from the rate of the advantaged neighbourhood. The difference is negative, meaning that there is a preference for the advantaged neighbourhoods
*** significant at the 1% level, ** at the 5% level, and * at the 10% level*

Table 9
Binomial Test for the existence of Discrimination

Pairwise comparisons on the same job offers	1st favourite group (N1)	2nd favourite group (N2)	P1 = N1/(N1+N2)	Null Hypothesis : P1 = ½		
				Alternative P1 < 1/2	**Alternative** P1 ≠ 1/2	**Alternative** P1 > 1/2
*Joint effect of the department and disadvantaged neighbourhood (*Disadvantaged Seine-Saint-Denis versus advantaged Paris)						
Cooks						
CAP	6	15	0,286	**0,039****	**0,078***	0,987
BAC	8	17	0,320	**0,054***	0,108	0,978
Waiters						
CAP	2	18	0,100	**0,000*****	**0,000*****	1,000
BAC	7	20	0,259	**0,010*****	**0,010*****	0,997
Effect of the department (Seine St Denis versus Paris)						
Cooks						
CAP						
Disadvantaged neighbourhood	11	10	0,524	0,500	1,000	0,668
Intermediate neighbourhood	6	7	0,462	0,500	1,000	0,709
Advantaged neighbourhood	8	13	0,381	0,192	0,383	0,905
BAC						
Disadvantaged neighbourhood	9	14	0,391	0,202	0,405	0,895
Intermediate neighbourhood	4	19	0,174	**0,001*****	**0,003****	0,999
Advantaged neighbourhood	8	19	0,296	**0,026****	**0,052***	0,99
Waiters						
CAP						
Disadvantaged neighbourhood	4	13	0,235	**0,024***	**0,049****	0,994
Intermediate neighbourhood	4	20	0,167	**0,000*****	**0,002****	0,999
Advantaged neighbourhood	3	19	0,136	**0,000*****	**0,001*****	0,999
BAC						
Disadvantaged neighbourhood	5	11	0,313	0,105	0,210	0,962
Intermediate neighbourhood	1	18	0,053	**0,000*****	**0,000*****	0,999
Advantaged neighbourhood	6	19	0,240	**0,007*****	**0,015****	0,998
Effect of neighbourhood disadvantaged *versus* advantaged						
Cooks						
CAP						
Paris	5	13	0,278	**0,048****	**0,096***	0,985
Seine-Saint-Denis	4	8	0,333	0,193	0,388	0,927
BAC						
Paris	7	11	0,389	0,240	0,481	0,881
Seine-Saint-Denis	9	7	0,563	0,773	0,804	0,402
Waiters						
CAP						
Paris	2	9	0,182	**0,033****	**0,065***	0,994
Seine-Saint-Denis	4	4	0,500	0,637	1,000	0,637
BAC						
Paris	8	15	0,348	0,105	0,210	0,953
Seine-Saint-Denis	5	5	0,500	0,623	1,000	0,623

The analysis is restricted to job offers for which the candidates from compared groups received different responses (1st accepted, second rejected, and vice versa). This is the exact binomial test of equal treatment.
**** significant at 1%, ** at 5%,* at 10%*
Notes : A significant test statistic in the column ''Alternative P1 < ½ ' means that dept. number 93 was preferred, a significant test statistic in the column ''Alternative P1 > ½ ' means that department number 75 was preferred.

In order to conduct a more formal test for the existence of discrimination, we conduct a binomial test whose null hypothesis is that no group is preferred over another. These results

are listed in Table 9. We conclude that there exists discrimination on the departmental level for all profiles except for the least-skilled cooks and those who are more skilled but residing in a disadvantaged neighbourhood. We conclude that there is a disadvantaged neighbourhood effect that is limited to unskilled workers in Paris, whether they are waiters or cooks.

Effects of the location of restaurants

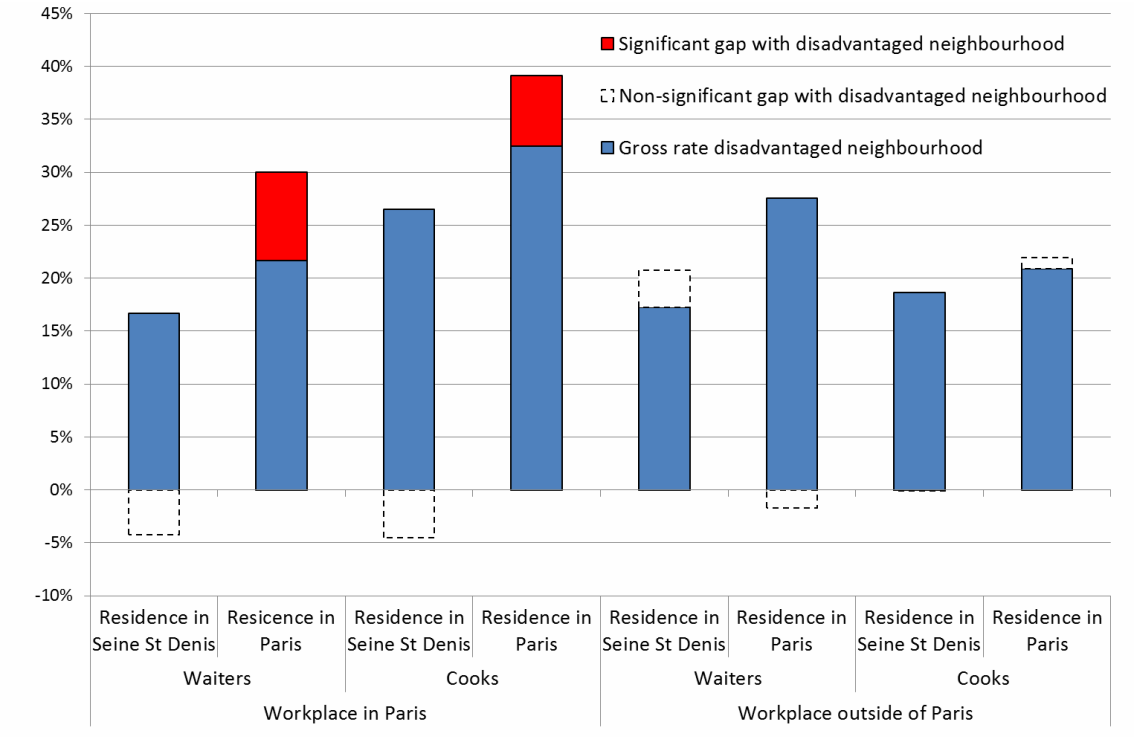
This first set of results is interesting, but it seems useful to distinguish between the location of restaurants as opposed to solely the location of the candidates. Table 10 shows the success rate depending on the location of the job offers, and we find that there are significant differences according to the place of origin of the offers. In the same vein, Figure 1 shows synthetic levels of success rate and the differences by place of residence for both occupations at the unskilled level, taking into account the location of job offers. We do see significant differences in the success rates between the different profiles of candidates according to whether the offers are located in Paris (left side) or outside of it (right side).

Table 10
Gross Rate of Success According to the place of residence and the place of the offer

	Rate of positive responses	t-stat	90% confidence interval	
			Lower Bound	Upper bound
Cooks				
Residence Paris - workplace Paris	33,5%	12,82	29,2%	37,8%
Residence Paris - workplace Seine-Saint-Denis	28,3%	4,79	18,6%	38,1%
Residence Paris - workplace other than department of Paris Area	19,3%	9,38	15,9%	22,7%
Residence Seine-Saint-Denis - workplace Paris	26,1%	10,75	22,1%	30,0%
Residence Seine-Saint-Denis - workplace Seine-Saint-Denis	28,4%	4,79	18,7%	38,1%
Residence Seine-Saint-Denis - workplace other than departement of Paris Area	15,7%	8,23	12,6%	18,9%
Waiters				
Residence Paris - workplace Paris	22,2%	10,38	18,7%	25,7%
Residence Paris - workplace Seine-Saint-Denis	11,9%	2,33	3,5%	20,2%
Residence Paris - workplace other than department of Paris Area	24,1%	9,96	20,2%	28,1%
Residence Seine-Saint-Denis - workplace Paris	10,1%	6,57	7,5%	12,6%
Residence Seine-Saint-Denis - workplace Seine-Saint-Denis	16,7%	2,86	7,1%	26,2%
Residence Seine-Saint-Denis - workplace other than department of Paris Area	13,6%	7,07	10,5%	16,8%

t-statistics were calculated by the bootstrap method using 10 000 draws
**** significant at 1%, ** at 5%, * at 10%*
Source : data from *testing* procedure

Graph 1
Gross Rate of success in disadvantaged neighbourhoods and gap between disadvantaged and non disadvantaged neighbourhoods for skilled workers



4. Econometric Estimates

In our experimental protocol, we do control for the characteristics of job seekers, but we do not control for the attributes of job offers made by companies. It is therefore necessary to verify whether the results generated by the descriptive statistics depend on the specific characteristics of the job offers. To determine, *all other things being equal*, the effects of the department and the type of neighborhood on the probability of obtaining a positive offer, it is possible to use a discrete choice, logistic model. Our specification is:

$$\log\left(\frac{p_{ij}}{1-p_{ij}}\right) = \beta_{0j} + \beta_{1j}DEP + \beta_2 QD + \beta_3 QD * DEP + \gamma X_{ij} \qquad (1)$$

with p_{ij} being the probability that the application i to the offer j is accepted

X: level of education, the position wanted (cook or server), characteristics of the job offer

QD: being located in a disadvantaged neighborhood

DEP: being located in the department of Seine-Saint-Denis.

Model 1 of Table 11 shows the results obtained when we impose a restriction on the coefficients β_{0j} to β_{1j} to such that they are invariant with respect to job offers. The estimating

sample contains all 2,988 observations for which an indicator is observed for each qualitative variable regarding both the candidates and the job offers.

The results confirm a very marked effect of the department and a strong neighborhood effect, albeit of lower magnitude. Table 12 presents the marginal effects[4] that are obtained from these results. The negative effect discerned for Seine-Saint-Denis is 9.3 points, and the effect of the disadvantaged neighborhood in Paris is 4.65 percentage points. This effect for the department is expressed in absolute value terms and has a magnitude comparable to the positive effect of holding a professional high school diploma relative to a CAP. The impact of living in Seine-Saint-Denis can also offset the advantage enjoyed by cooks relative to waiters, which is attributed to the difficulties in recruitment in this occupation.

The interacted effect of the department and the neighborhood is of the opposite sign, which means that a disadvantaged neighborhood is less detrimental when one lives in a department that is already disadvantaged. The penalty associated with hiring people from disadvantaged neighborhoods is higher in Paris than in Seine-Saint-Denis.

Models 2 and 3 of Table 11 introduce a hierarchical structure (Bryk and Raudenbush (1992), Hox (2002)). They allow one to take account of the structure of the data obtained with the testing procedure and to test the sensitivity of coefficients associated with the effects of the department and neighborhood to the characteristics of job offers. The objective is to control for the observable effects and to adjust for the unobservable influences associated with job offers to which CVs were sent. The form of the hierarchical model allows for parameters as follows:

$$\beta_{kj} = \beta_{k0} + \alpha_k d75 + u_{kj} \qquad (2)$$

The parameter β_{kj} is a linear combination of the average effect for each offer expressed by the coefficients β_{k0}, which is a fixed effect related to the characteristics of offers, $\alpha_k d75$, and a random disturbance term u_{kj}. The variable d75 equals 1 if the job is located in Paris and 0 otherwise, and the index k refers to the firm.

Model 2 corresponds to the case where only β_{0j} varies according to the offers. This model is identical to a logit model with random effects. The intra-class correlation is strong because

[4] The marginal effect associated with living in a disadvantaged neighborhood in Seine-Saint-Denis is formally obtained by calculating: _) where _ is a vector of the means of the explanatory variables except for QD and DEP, and _. This formula applies because all of our variables are discrete.

more than 80% of the total variance is explained by the hierarchical structure of the data. When taking into account this dimension of variation, the marginal effect associated with the department and the neighborhood fall considerably, but it remains large and statistically significant.

Model 3 integrates three elements associated with the offers that may affect the coefficients of the department and the neighborhood. Several tests were performed and only the coefficient β_{1j} changes significantly depending on the location of the job offers.

Table 11
Estimates of the probability of having a positive response

	Model 1		Model 2		Model 3	
Localization of the offer	Coef.	std.	Coef.	std.	Coef.	std.
Locality in Seine St Denis (Dep93)	-0.595***	0.114	-1.395***	0.183	-1.608***	0.445
Locality in sensitive urban area (zus)	-0.268**	0.134	-0.642***	0.208	-0.749***	0.227
zus*dep93	0.312	0.200	0.742**	0.306	0.882**	0.344
Characteristics of the individual						
Advanced certification	0.400***	0.106	1.147**	0.491	1.531***	0.541
Offer for a cook (ref. waiter)	0.482***	0.100	1.019**	0.450	1.340**	0.562
Characteristics of the offer and the enterprise						
Entreprise located in Paris proper (d75)	0.490***	0.104	1.005**	0.455	1.069**	0.517
Offer found in Pôle Emploi	0.555***	0.116	0.933*	0.519	0.980*	0.597
Type of entreprise (ref : brewers pubs)						
Asian specialties	-0.555*	0.321	-0.792	1.253	-0.953	1.457
Crêperies	-0.100	0.166	-0.031	0.696	0.078	0.800
Gourmet type restaurants	0.236	0.396	0.380*	1.919	0.671	2.190
Pizzerias and Italian restaurants	0.537***	0.197	1.169	0.919	1.715*	1.059
Traditional Restaurants	0.610**	0.282	1.395	1.326	2.124	1.519
Hôtels restaurants	0.229	0.157	0.514	0.709	0.657	0.814
Autres	0.613***	0.178	1.503*	0.832	1.986**	0.958
NSP	0.577***	0.206	1.258	0.933	1.974*	1.070
Constant	-2.213***	0,210	-4.966***	0,832	-6.068***	0.981
sigma u0			3.699***	0,287	4.304***	0.345
d75*Dep93					-0.996**	0.508
Sigma u1					2.614***	0.362
intra-class correlation			80.6%	%	67.5%	
Pseudo-R2	4.65%		4.86%		7.8%	
Log likelihood	-1445.8		-989.2		-958.5	
Akaike Information criterion	2929.7		2018.3		1961.0	

The estimated standard errors are calculated via bootstrapping based on 10,000 draws
**** significatif au seuil de 1%, ** de 5%, * de 10%*
Source : data generated through *testing*

The following relation is obtained from model (3):

$$\hat{\beta}_{1j} = \underset{(0.445)}{-1.608} + \underset{(2.614)}{-0.996}\, d_{75} + \hat{\mu}_{kj} \; with \; \hat{\mu}_{kj} \sim N(0, 2.61^2)$$

The negative effect of the department is distributed normally with mean - 2.604 and variance 2.61^2 for job offers located in Paris. The average of this effect is only -1.608 for job offers located outside of Paris with the same underlying variance. However, the job offers located in Paris have a conflicting effect for candidates located in Seine-Saint-Denis. It generally leads to a higher rate of response relative to other places of origin for offers, but employers tend to discriminate more against candidates from that department.

Table 12
Determination of marginal effects associated with the department and the neighborhood

	Model 1	Model 2	Model 3
Located in Seine St Denis	-9,23***	-4,24***	-7,61***
Located in ZUS in Seine-St-Denis	-8,83***	-4,09***	-7,51***
Located in ZUS in Paris	-4,65***	-2,63***	-4,41***
Advanced certification	5,07***	1,63***	1,91***

**** significatif at the level of 1%, ** de 5%, * de 10%*
Source : data generated from *testing*

5. Conclusions

We have shown that the residence of a job applicant could have an effect on the chances of access to employment according to several spatial scales. This effect of residence exists at the departmental level , and it is very strong in the case of Seine-Saint-Denis. This effect also exists to a lesser extent at the level of the neighborhood of residence. The two effects are cumulative while partially offsetting, and they are important in magnitude, since living at a ``good address`` can triple the chances of being invited to a job interview. Living in a disadvantaged neighborhood is less of a handicap when the applicant lives in a disadvantaged department.

These conclusions are based on a controlled experiment carried out in Ile-de-France, for fictional job candidates residing in Paris and in Seine-Saint-Denis, between October 2011 and February 2012 for the occupations of waiters and cooks. They are not necessarily applicable to other locations, other time periods, and other professions or occupations. It would be necessary carry out new tests for the existence of discrimination in order to confirm their level of generality. Nevertheless, our findings confirm those from previous studies on other professions or occupations, which consistently concluded that there exists a marked effect of

residence (Duguet *et al* [2010], L'Horty *et al* [2012], Small *et al* [2013]). Our findings dovetail with the point that the applicant`s place of residence sends a signal that may capture a combined effect of the department, the town or municipality, and the neighborhood. It appears that unemployed workers have a strong incentive to change their place of residence, both the neighborhood but also the department. This phenomenon has the potential to reinforce the spatial disparities in access to employment by promoting the spatial concentration of job seekers.

The place of residence plays an active role in the individual determinants of return to work through the behavior of employers who select candidates based on their address. Until recently the existence of discrimination in employment related to the place of residence, as opposed to discrimination based on gender or ethnic origin, was not discerned in France. At the present time, discrimination based on the place of residence is not among the criteria upon which discrimination is forbidden by law. (Article 225-1 of the Criminal Code). To explain the effect specific to the place of residence, we turn to sources of statistical discrimination, that is to say discrimination based not on preferences but rather on information available to the employer. In the absence of perfect information about the productivity of job applicants, employers attribute to these individual candidates what they think are the average characteristics of populations represented particularly in these neighborhoods, i.e. French immigrants with vulnerable incomes and unstable employment situations. Based on these perceptions, the place of residence could be perceived as a signal of lower professional reliability or of an undiversified social network.

In a similar vein to the case of discrimination based on ethnic origin, which may affect immigrant inhabitants or their descendants, groups that are overrepresented in the ZUS - , it seems to us that the existence of discrimination due to place of residence justifies the implementation of remedial policies. We think of features of urban policy that are targeted at disadvantaged neighborhoods, for which there might exist a new source of justification. We think more broadly of all public policies that should take better account of the territorial criteria in their implementation, especially for social and employment policies. We also think that discrimination based on place of residence should be legally recognized, and that it becomes a ground of discrimination that is prohibited by law.

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Appendix 1

Additionnal information on the restaurant industry in Ile-de-France

Table A1 : Place of residence and of work for waiters and cooks in Paris and in Seine-Saint-Denis

	Waiters	Cooks	Hotels-Cafés-Restaurants (HCR)	Non HCR
Residence 75 - work 75	67%	55%	62%	58%
Residence 93 - work 93	9%	15%	11%	20%
Residence 75 - work 93	1%	3%	2%	6%
Residence 93 - work 75	23%	27%	25%	16%
Total	**53 292**	**37 476**	**90 768**	

Source : DADS, 2009, Insee

Table A2 : Difficulties in recruitment declared by firm managers in Paris and in Seine-Saint-Denis

Occupation label	Paris	Seine-Saint-Denis
Aides, apprentices, polyvalent kitchen employees (including crepes, pizzas,)	*19%*	*17%*
Cooks	*45%*	*59%*
Chief cooks	*33%*	*51%*
Waiters in cafés, restaurants and commissaries (cafeteria?)	*38%*	*25%*
Hotel managers, innkeepers	50%	100%
Hotel Employees	38%	26%
Skilled hotel workers, team leaders	91%	0%
Hotel and restaurant management, including institutional dining	74%	19%
Average Hotel-café-restaurants	**33%**	**27%**
Total for department	**35%**	**32%**

Source : BMO survey, 2009, Pole emploi

Table A.3: Distribution of firms and employment in the HCR sector in Paris and in Seine-Saint-Denis

	Number of establishments			Number of workers		
Activity	Paris	Seine-Saint-Denis	Total	Paris	Seine-Saint-Denis	Total
traditional restaurant	7 715	1 134	8 849	66 590	5 191	71 781
Fast food restaurant	2 662	827	3 489	20 070	4 863	24 933
Institutional food under contract	280	105	385	2657	1 537	4 194
Other types of restaurant	315	139	454	4260	1 396	5 656
Hotels and lodging	1 909	264	2 173	32 263	2 772	35 035
Tourist and other short term lodging	83	6	89	3 312	50	3 362
Other types of lodging	113	28	141	1 725	338	2 063
Beverage	685	163	848	3 669	468	4 137
Cafeteria and self-service	23	7	30	376	211	587
Catering services	195	57	252	2 451	481	2 932

Source : DADS, 2009, Insee

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